From: Derek D. Ingram
To: Miller, Barbara J; Meyer, Lisa A
Subject: [EXTERNAL] Huster Bio-Feed Summary
Date: Wednesday, August 03, 2022 11:38:16 AM

Barb/Lisa,

On July 6th, LEA setup the bio-feed injection system at Huster. Injection of the nutrients and BAC-9 (augmented micro-organisms) began the next day on the 7th. Injections continued for the next 2 weeks. An emphasis was placed on injecting a large quantity into MW-8 knowing the MW-11 and MW-12 could take high volumes due to the 4" construction. This required more field time but placed a larger quantity of both nutrients and bugs into a higher concentration area.

Batch Ratio:

Injection batches were mixed in either a 500-gallon or 2500 gallon poly tank. The larger was the main batch mix and the smaller used to continue injections while the larger tank was mixed. To make mathematics easy, the following 500-gallon water mix was used and then multiplied by 5 when using the larger tank:

- 1.8 gallons EOS Pro
- 0.66 Liters BAC-9
- 75 grams Sodium Sulfide Hydrate (to lower ORP)
- 3 oz. Miracle Grow
- 0.25 oz. B-12 concentrate

During batching, a sump pump was used to thoroughly mix the components into solution.

Deviations from planned approach:

1. The start of the project was delayed due other site construction activities when the BAC-9 was delivered. This delay was about 6 days. BAC-9 has a shelf-life of 2-weeks when maintained at cold temperatures. It was packed in fresh ice daily while awaiting injection and during the injection process. To ensure its integrity, the entire volume was injected during the initial week of injections rather than push the shelf-life over the entire injection period.
2. June quarterly groundwater sampling identified ND values at MW-10 for both cis and VC. The initial scope was to inject nutrients at this location; however, with the non-presence of constituents for the bugs to address, the volume was transferred to other wells.
3. The majority of the injection was gravity feed using head from the 2500 poly-tank; however, over time, the sugars from the EOS reduces the ability for gravity feed and a sump pump was used to increase pressure (NOTE: as the bio-mass consumes the EOS, the pore space and well screens will open up for future injection needs)

Volumes of injection:

The volumes estimated were based on batch mixes using the 500 and 2500 gallon volumes that were injected. So the volumes are estimates provided by the field crew. A total of 19 liters of BAC-9 was injected.

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MW-11	10,800 gallons	5-6 liters of BAC-9
MW-12	10,900 gallons	5-6 liters of BAC-9
MW-8	8,000 gallons	8-9 liters of BAC-9
MW-13	300 gallons	

We injected the dilute EOS mixture and added the BAC-9 near the middle to end of each batch.

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